A Minimal Book Example

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Contents

Preface

This is a *sample* book written in **Markdown**. You can use anything that Pandoc's Markdown supports; for example, a math equation $a^2 + b^2 = c^2$.

Usage

Each **bookdown** chapter is an .Rmd file, and each .Rmd file can contain one (and only one) chapter. A chapter *must* start with a first-level heading: `# A good chapter`, and can contain one (and only one) first-level heading.

Use second-level and higher headings within chapters like: `## A short section` or `### An even shorter section`.

The `index.Rmd` file is required, and is also your first book chapter. It will be the homepage when you render the book.

Structure of the book

Ackowledgments

About the author

Part I

Get Started

Chapter 1

Introduction

All chapters start with a first-level heading followed by your chapter title, like the line above. There should be only one first-level heading (`#`) per .Rmd file.

1.1 Installation of R and Rstudio

All chapter sections start with a second-level (`##`) or higher heading followed by your section title, like the sections above and below here. You can have as many as you want within a chapter.

1.2 Installation of R

To install R, we need to follow these basics instructions

1.2.1 Windows:

- Go to the website of the CRAN (Comprehensive R Archive Network): CRAN
- Select a mirror close to your location.
- Click on the link "Download R for Windows".
- Click on "base" then on "Download R x.x.x for Windows" (where x.x.x is the latest version).
- Follow the installation instructions.

1.2.2 Mac:

- Go to the website of the CRAN: CRAN
- Select a mirror close to your location.
- Click on the link "Download R for (Mac) OS X".
- Download the latest version "R-x.x.x.pkg" (where x.x.x is the latest version).
- Follow the installation instructions.

1.2.3 Linux:

- Instructions vary by distribution. Check the CRAN for specifics to your distribution.

1.2.4 Install RStudio:

- Go to the RStudio website: RStudio
- Download the version suitable for your operating system (Windows, Mac, Linux).
- Follow the installation instructions.

1.3 Intro to Rmarkdown

1.3.1 Install `rmarkdown` from RStudio:

- Open RStudio.
- In the R console (typically at the bottom left), type:

```
# Install from CRAN
install.packages('rmarkdown')

# Or if you want to test the development version,
# install from GitHub
if (!requireNamespace("devtools"))
  install.packages('devtools')
devtools::install_github('rstudio/rmarkdown')
```

- Press "Enter". This will install the `rmarkdown` package and its dependencies.

If you want to generate PDF output

1. You need to install **LaTeX**
2. Or you install TinyTeX (https://yihui.name/tinytex/), instead:

I will recommend the second option since it,s the easiest.

```
install.packages('tinytex')
tinytex::install_tinytex()  # install TinyTeX
```

1.3.2 Verifying the installation

In RStudio, go to `File` > `New File` > `R Markdown...`. If you can see a pop-up window allowing you to create a new R Markdown document, the installation was successful!

1.4 First Rmardown code

R Markdown is a powerful tool for creating dynamic documents, presentations, and reports that combine narrative text with code and its output. It's especially popular in the data science community for its ability to integrate data analysis with documentation. The structure of an R Markdown document typically includes the following components:

1. A YAML header: The document begins with a YAML (Yet Another Markup Language) header, enclosed within `---` lines
2. A text: Normal text including elements like : headers, lists, links, etc.
3. A code chunk : R Markdown allows embedding R code chunks within the document. These chunks are enclosed in triple backticks (“‘) with {r} at the start to indicate they are R code. Within these chunks, you can write R code that can be executed to display results, graphs, and tables directly in the document

1.4.1 YAML header

A YAML header is of the form

```
---
title: "Hello R Markdown"
author: "The big boss"
date: "2018-02-14"
output: html_document
---
```

Chapter 2

Basics commands in R

2.1 Cross-references

Cross-references make it easier for your readers to find and link to elements in your book.

2.2 Chapters and sub-chapters

There are two steps to cross-reference any heading:

1. Label the heading: `# Hello world {#nice-label}`.
    - Leave the label off if you like the automated heading generated based on your heading title: for example, `# Hello world` = `# Hello world {#hello-world}`.
    - To label an un-numbered heading, use: `# Hello world {-#nice-label}` or `{# Hello world .unnumbered}`.
2. Next, reference the labeled heading anywhere in the text using `\@ref(nice-label)`; for example, please see Chapter 2.1.
    - If you prefer text as the link instead of a numbered reference use: any text you want can go here.

2.3 Captioned figures and tables

Figures and tables *with captions* can also be cross-referenced from elsewhere in your book using `\@ref(fig:chunk-label)` and `\@ref(tab:chunk-label)`, respectively.

See Figure 2.1.

```
par(mar = c(4, 4, .1, .1))
plot(pressure, type = 'b', pch = 19)
```

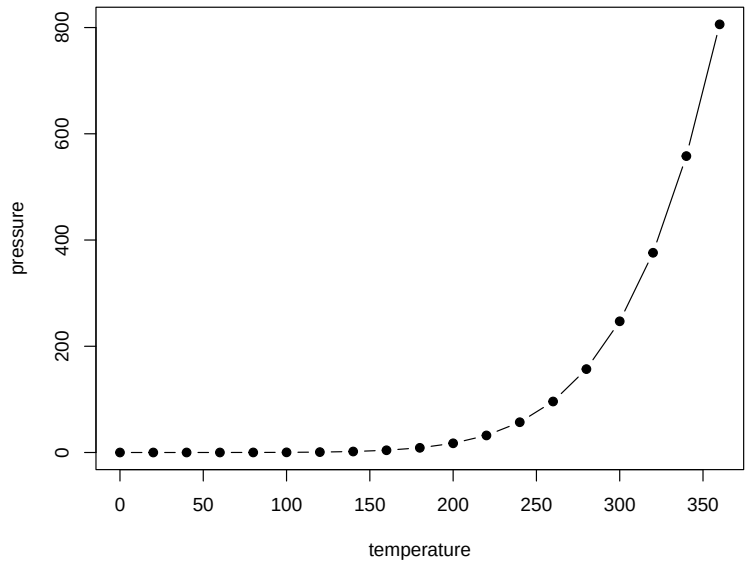

Figure 2.1: Here is a nice figure!

Don't miss Table 2.1.

```
knitr::kable(
  head(pressure, 10), caption = 'Here is a nice table!',
  booktabs = TRUE
)
```

Table 2.1: Here is a nice table!

temperature	pressure
0	0.0002
20	0.0012
40	0.0060
60	0.0300
80	0.0900
100	0.2700
120	0.7500
140	1.8500
160	4.2000
180	8.8000

Part II

Projects and labs

Chapter 3

Regression in R

3.1 Parts

You can add parts to organize one or more book chapters together. Parts can be inserted at the top of an .Rmd file, before the first-level chapter heading in that same file.

Add a numbered part: `# (PART) Act one {-}` (followed by `# A chapter`)

Add an unnumbered part: `# (PART\*) Act one {-}` (followed by `# A chapter`)

Add an appendix as a special kind of un-numbered part: `# (APPENDIX) Other stuff {-}` (followed by `# A chapter`). Chapters in an appendix are prepended with letters instead of numbers.

Chapter 4

Time series analysis

Chapter 5

Blocks

5.1 Equations

Here is an equation.

$$f\left(k\right) = \binom{n}{k} p^k \left(1-p\right)^{n-k} \tag{5.1}$$

You may refer to using `\@ref(eq:binom)`, like see Equation (5.1).

5.2 Theorems and proofs

Labeled theorems can be referenced in text using `\@ref(thm:tri)`, for example, check out this smart theorem 5.1.

Theorem 5.1. *For a right triangle, if c denotes the* length *of the hypotenuse and a and b denote the lengths of the* ***other*** *two sides, we have*

$$a^2 + b^2 = c^2$$

Read more here https://bookdown.org/yihui/bookdown/markdown-extensions-by-bookdown.html.

5.3 Callout blocks

The `bs4_book` theme also includes special callout blocks, like this `.rmdnote`.

You can use **markdown** inside a block.

```
head(beaver1, n = 5)
#>   day time  temp activ
#> 1 346  840 36.33     0
#> 2 346  850 36.34     0
#> 3 346  900 36.35     0
#> 4 346  910 36.42     0
#> 5 346  920 36.55     0
```

It is up to the user to define the appearance of these blocks for LaTeX output.

You may also use: `.rmdcaution`, `.rmdimportant`, `.rmdtip`, or `.rmdwarning` as the block name.

The R Markdown Cookbook provides more help on how to use custom blocks to design your own callouts: https://bookdown.org/yihui/rmarkdown-cookbook/custom-blocks.html

Chapter 6

Sharing your book

6.1 Publishing

HTML books can be published online, see: https://bookdown.org/yihui/bookdown/publishing.html

6.2 404 pages

By default, users will be directed to a 404 page if they try to access a webpage that cannot be found. If you'd like to customize your 404 page instead of using the default, you may add either a `_404.Rmd` or `_404.md` file to your project root and use code and/or Markdown syntax.

6.3 Metadata for sharing

Bookdown HTML books will provide HTML metadata for social sharing on platforms like Twitter, Facebook, and LinkedIn, using information you provide in the `index.Rmd` YAML. To setup, set the `url` for your book and the path to your `cover-image` file. Your book's `title` and `description` are also used.

This `bs4_book` provides enhanced metadata for social sharing, so that each chapter shared will have a unique description, auto-generated based on the content.

Specify your book's source repository on GitHub as the `repo` in the `_output.yml` file, which allows users to view each chapter's source file or suggest an edit. Read more about the features of this output format here:

https://pkgs.rstudio.com/bookdown/reference/bs4_book.html

Or use:

```
?bookdown::bs4_book
```

Chapter 7

Hello bookdown

All chapters start with a first-level heading followed by your chapter title, like the line above. There should be only one first-level heading (`#`) per .Rmd file.

7.1 A section

All chapter sections start with a second-level (`##`) or higher heading followed by your section title, like the sections above and below here. You can have as many as you want within a chapter.

An unnumbered section

Chapters and sections are numbered by default. To un-number a heading, add a `{.unnumbered}` or the shorter `{-}` at the end of the heading, like in this section.